

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code:EL20711

Subject: Electrical Machines-III

Minimum number of Class tests to be conducted: 2

UNIT I: Theory of Ideal Synchronous Machines

The ideal synchronous machine, synchronous machine inductances, transformation to direct and quadrature axis variables, basic machine relation in $dq0$ variables, steady state analysis using $dq0$, transient analysis, three-phase short circuit, transient power angle characteristics, effect of additional rotor circuits.

UNIT II: Theory of Ideal Poly-Phase Induction Machines

The ideal induction machine, transformation to dq variables, basic machine relation in dq variables, steady state analysis using $dq0$, electrical transients in induction machine, single phasing of three-phase induction motor, power invariance.

UNIT III: Fractional Horse Power Motor

Qualitative examination, starting and running performance of single phase induction motor, revolving field theory of single-phase induction motor, AC tachometer, unbalanced operation of symmetrical two-phase machine, the symmetrical component concept, two-phase control motors.

UNIT IV: AC Commutator Motors

Rotational EMFs in commutator windings, action of commutator as frequency converter, effect of EMF injection in secondary circuit of three-phase slip-ring induction motor, secondary (slip) power, constant HP and constant torque drives, Kramer and Scherbius system of speed control, single-phase series motors, universal motors, phasor diagrams, methods of improving commutation.

UNIT V: Special Motors

Hysteresis motor, reluctance motor, stepper motor, Synchros and linear induction motor, Permanent magnet brushless BC motor.

Text Books:

1. Electrical machines by Fitzgerald and Kingsley, 2nd edition, McGrawHill.
2. Performance and design of AC commutator machines by E. O. Taylor.

Reference Books:

1. Generalized theory of electrical machines by Bimbhra, Khanna Pbs.
2. Power system stability, vol-3 by Kimbark, Wiely
3. General theory of electrical machines by Adkins.

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code: EL20712

Subject: Management Concepts & Techniques

Minimum number of Class tests to be conducted: 2

UNIT I:

Basic management and techniques: Planning, nature purpose and objectives of planning organizing nature and purpose of organizing, authority and responsibility, staffing, supply of human resources, performance appraisal, controlling, system and process of controlling, control techniques.

Human resource management: nature and scope of human resource planning, training and development, recruitment and selection, career growth, absenteeism, grievances, persuasion, reward and punishment. Theories of motivation and their relevance. Communication. Leadership types of leaders, leadership styles roles and functions of leaders, group and team working. Understanding group behavior and dynamics. Conflict Management. Innovation in Organizational Design such as Networks, centralize and distributed management system.

UNIT II

Marketing management: Concept and Analysis of Macro-business environment: marketing environment, customer markets and buyer behavior, marketing mix, advertising and sales promotion, channels of distribution, Indian and global(E-business), Directions of change and impact on business decision, Liberalization, Globalisation and Corporatisation Problems and Prospects. Financial management and accounting concepts: book keeping, financial statements analysis, financial ratios, capital budgeting, and breakeven analysis.

UNIT III

Production/operations management: planning and design of production and operations systems, facilities planning, location, layout and movement of materials, materials management and inventory control, maintenance management, PERT and CPM. Supply Chain Management-Vendor Evaluation and Audit. Quality Management,

UNIT IV

Management information systems: role of information in decision making, information system planning, design and implementation, evaluation and effectiveness of the information system, statistical quality control, total quality management and ISO certificate, ISI certificate, System Development-Overview of Systems and Design. System development Management life-cycle, Designing on-line and Distributed environments.

UNIT V

Social and ethical issues in management: ethics in management, social factors, unfair and restrictive trade practices.

Strategic and technology management: need, nature, scope and strategy SWOT analysis, value chain concept.

Text Books:

1. Industrial management and engineering economics, K. C. Arora, Khanna Pbs.
2. Industrial engineering and production management, Martand Telsang, S. Chand
3. Industrial management and organization, Ahuja, Khanna Pbs.

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Subject: Management Concepts & Techniques (Continue.....)

4. Industrial engineering and management, O. P. Khanna, DRD

5. industrial management, ankur chabra

Reference Books:

1. Industrial organization and management, Ramchandran, Ramana Mutrhy, TMH.

2. Management science, Ramchandra, TMH.

3. Industrial engineering and production management, Mahajan, DRP.

4. Management theory and practice, Chandan, Vikas Pbs.

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code: EL20713

Subject: High Voltage Engineering

Minimum number of Class tests to be conducted: 2

UNIT I: Breakdown in Gases

Gases as insulating media, Ionization processes, Electron avalanche, Townsend's criterion for breakdown, streamer theory of breakdown, Gaseous discharge in uniform field, Paschen's law, Breakdown in non-uniform field, corona discharges, effect of polarity on corona & breakdown voltage. Corona in transmission lines, Empirical formulae for corona loss, Methods of reducing corona loss.

UNIT II: Dielectrics

Liquid Dielectrics: conduction & breakdown in pure liquids and commercial liquids, Methods for determination of breakdown strength. Factors affecting dielectric strength of liquids.

Solid Dielectrics: -Breakdown mechanism, Intrinsic breakdown, Electromechanical breakdown, thermal breakdown, breakdown of solid dielectric in practice, Breakdown due to treeing & tracking, breakdown due to the internal discharges.

UNIT III: Generation of high voltages

Generation of high D.C. voltages, half wave & full wave rectifier circuits, Voltage doublers and multiplier circuits Van De Graff generators, Electro-static Generators, Generation of high alternating voltages, cascade transformers, Resonant transformer, Generation of impulse voltages, Standard impulse wave shapes, Analysis of model, Multistage Impulse generator, Marx circuit, Tripping & control of Impulse generators.

UNIT IV: Measurement of high Voltages

Measurement of high AC and DC voltages by micro ammeter, Resistance and potential divider, series Impedance voltmeter, series capacitance voltmeter capacitance potential dividers & capacitance voltage transformers, Resistance potential dividers, Generating voltmeters, Electrostatic voltmeter, Spark gap for measurement of high D.C., A.C. & impulse voltages, Potential divider for impulse voltage measurements, CRO for impulse voltage measurements.

UNIT V: High Voltage Testing of Electrical Apparatus:

Test on insulators, Dry & wet flash Over tests & withstand tests, Impulse flash over & withstand voltage test, High voltage tests on cables Impulse testing of transformers.

Non-Destructive Testing: Measurement of dielectric constant & loss factor, High voltage Schering Bridge, Partial Discharge Measurements.

Text Books:

1. High Voltage Engineering by M.S. Naidu & V.Kamraju, TMH Pbs.
2. Kuffel E.; High Voltage: Engineering fundamentals; Butterworth-Heineman, 2000.

Reference Books:

1. High voltage Insulation Engineering by Ravindra Arora, New Age International.
2. High Voltage Engineering By Dr.R.S.Jha, Dhanpat Rai & Sons.
3. Wadhawa, C.L.; High Voltage Engineering, Wiley Eastern Ltd, New Age Ltd, India, 1995.
4. Extra High Voltage A.C. Transmission Engineering by R.D. Begamudre Wiley Eastern Limited.

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code: EL20731

Subject: Advanced Microprocessors (Elective-II)

Minimum number of Class tests to be conducted: 2

Unit –I

Introduction to 8051 family, introductions to general-purpose microprocessor, Micro controller for embedded for system. A brief history of 8051, 8052, 8751, AT8951, pin configuration of 8051, 89C52RD2.

Unit-II

Instruction set, 8051 assembly language programming, Internal Structure of 8051, power resetting, Built up RAM & ROM, I/O programming and addressing modes.

Unit-III

Counter and Timer details, Counter and Timer programming using 8051, interrupt programming, Types of Interrupt.

Unit-IV

Asynchronous serial communication, Data programming, RS232 standard, RS422 standard, 1488 & 1489 standard, GPIB, MAX232 Driver, serial communication programming.

Unit-V

ADC & DAC interfacing, stepper motor interfacing, Keyboard interfacing Memory interfacing, embedded design concept, embedded design card, 8096 Architecture.

Textbooks:

1. 8051 programming, interfacing and Application K J Ayala, Penram; TMH
2. 8051 Micro controller & Embedded System: Muhammed Ail Mazidi And Janice Gillispie Mazidi
3. 8 Micro controller & Embedded System Manual.
4. Embedded System, Raj Kamal; TMH

Reference Books:

1. Programming and customizing the 8051 micro controller, Predko:TMH
2. Hand book of micro controller, Myke Predko;MH
3. Embedded System,Design: Frank Vihid/Tony Givargis
4. Embedded System Design: An introduction to processes, Tool And Techniques, Arnold. S.Berger

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code:EL20732

Subject: (Elective-II) Micro Controller & Embedded System

Minimum number of Class tests to be conducted: 2

Unit –I

Introduction to 8051 family, introductions to general-purpose microprocessor, Micro controller for embedded for system. A brief history of 8051, 8052, 8751, AT8951, pin configuration of 8051, 89C52RD2.

Unit-II

Instruction set, 8051 assembly language programming, Internal Structure of 8051, power resetting, Built up RAM &ROM, I/O programming and addressing modes.

Unit-III

Counter and Timer details, Counter and Timer programming using 8051, interrupt programming, Types of Interrupt.

Unit-IV

Asynchronous serial communication, Data programming, RS232 standard, RS422 standard, 1488 &1489 standard, GPIB, MAX232 Driver, serial communication programming.

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National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code: EL20733

Subject: Modeling & Simulation(Elective-II)

Minimum number of Class tests to be conducted: 2

Unit-I

System Models & Role of simulation: Basic concept & nomenclature, Types of system-Determination,

Stochastic, Continuous & Discrete Systems, System Simulation-Uses of simulation & its limitation, Steps in simulation studies-Statistical Tool: Generation & Testing of pseudorandom numbers, Randomvariate generation for Uniform, Exponential Normal & poisson distributions, Sampling & Estimation, Maximum Likelihood estimation, Confidence interval estimation.

Unit –II

Discrete Event Simulation: -Representation of time, Approach to discrete event simulation Queuing Models- Single & multi-server queues, Steady state behavior of queues, Network of queues, Inventory System simulation, Programming languages for discrete system simulation-GPSS, SIMSCRIPT (Brief overview)

Unit-III

Modeling & performance Evaluation of computer Systems: Behavioral, Data flow & structural modeling, Overview of hardware, Modeling & Simulation, Simulation for behavioral model, Evaluation of multiprocessor systems, workload characterization & Benchmarks.

Unit-IV

Continuous System Simulation: Continuous System Models-Open & closed loop systems, Model described by differential equations, Systems dynamics, Growth & decay models, Systems dynamics diagram, Simulation of aircraft models, Biological & sociological systems simulation, Simulation Languages Overview-CSMP.

Unit-V

Virtual Reality Modeling: Overview of Virtual Reality Modeling Language VRML 2.0, creating dynamic worlds, integrating JavaScript's either VRML Verification & Validation of Simulation Models: Goals of Model Verification & validation, Input data Analysis, Output Analysis, Sensitivity analysis, Hypothesis testing, Performance measures & their estimation

TextBooks:

1. Discrete System Simulation, J.E.Banks, Prentice Hall
2. System Simulation, G.Gordon, PHI
3. Computer Systems Performance Evaluation, D.Ferrari, Prentice Hall

Reference Books:

1. A VHDL Primer, J.Bhastav, Prentice Hall

National Institute of Technology, RAIPUR

B.Tech.-VII Semester

Branch: Electrical Engg.

Code: EL20734

Subject: Process Control (ELECTIVE-II)

Minimum number of Class tests to be conducted: 2

UNIT – I

Special characteristics of process systems large time constraints, interaction, multistage, pure lag, control loops for simple systems and their Dynamics & stability.

UNIT – II

Generation of control action in electronic and pneumatic controllers, control valves, valves positiners, relief and safety valves, relays, volume boosters, pneumatic transmitters for process variable, Tuning of controllers – Zeigler Nichols and other techniques.

UNIT – III

Different control techniques and interaction of process parameters e.g. feed forward, cascade, ratio, override controls, batch continuous process controls, Feed forward Control scheme.

UNIT – IV

Various process schemes / unit operations and their control schemes e.g. distillation columns, absorbers, heat exchangers, furnaces, reactors, mineral processing industries, etc. Use of control schemes for process optimization.

UNIT – V

Advanced control strategies with case studies, Use of DDC and PLC, Introduction to supervisory control, Conversion of existing control schemes in operating plants, data - loggers.

Text Books:

1. Dale Patrick, Stephen Fardo, “Industrial Process Control system”.
2. Smith C.A. & A.B. Corripio,” Principal & Practiced Automatic Process Control”, J.Willey.

Reference books:

1. Shinsky F.G.” Process control System”, III Ed. McGraw Hill
2. Rao M & S.Qiv,”Process Control Engg.”Gorden & Breach